

Amendment to the Claims

1 through 19. (Canceled) Please cancel claims 1 through 19.

20. (New) A control circuit for a laser diode, the circuit comprising:

a power control circuit for controlling an adjustable bias current to the laser diode that includes:

a bias current source that provides an adjustable bias current to the laser diode and having a power reference voltage input;

a power monitor loop including a backface diode for monitoring the laser diode power output to provide a power monitor signal;

a power control signal combined with the power monitor signal to provide a power adjust signal, wherein the bias current source adjusts the bias current responsive to a difference between the power reference voltage input and the power adjust signal; and

a temperature control circuit that provides a control current to a thermoelectric element for controlling temperature operation and wavelength of the laser diode that includes:

a temperature reference voltage input;

a temperature monitor loop including a temperature sensor for monitoring the temperature operation point to provide a temperature monitor signal;

a wavelength compensation signal combined with the temperature monitor signal to provide a wavelength control signal, wherein the wavelength compensation signal is proportional to the power control signal;

wherein the temperature control circuit adjusts the control current to the thermoelectric element responsive to a difference between the temperature reference voltage input and the wavelength control signal to help maintain operation of the laser diode around a nominal operating wavelength.

21. (New) The power control circuit of claim 20, wherein the bias current source that provides an adjustable bias current to the laser diode and having a power reference voltage input comprises:

- an operational amplifier with the power reference voltage as a first input and the power adjust signal as a second input; and

- a transistor, wherein an output of the operational amplifier is connected to a gate of the transistor, a reference voltage is connected to an input of the transistor and wherein the output of the transistor is connected to the laser diode and provides the adjustable bias current to the laser diode.

22. (New) An optical transmitter, comprising:

- a laser diode with an output signal;

- a power control circuit for controlling an adjustable bias current to the laser diode that comprises:

  - a bias current source that provides an adjustable bias current to the laser diode and comprising a power reference voltage input;

  - a power monitor loop comprising a backface diode for monitoring the laser diode power output and outputting a power monitor signal;

  - a power control signal added to the power monitor signal to provide a power adjust signal, wherein the bias current source adjusts the bias current responsive to a difference between the power reference voltage input and the power adjust signal; and

- a temperature control circuit that provides a temperature control signal to a thermoelectric element for controlling temperature operation of the laser diode that comprises:

  - a temperature reference voltage input;

  - a temperature monitor loop including a temperature sensor for monitoring temperature operation and providing a temperature monitor signal;

a wavelength compensation signal added to the temperature monitor signal to provide a wavelength control signal, wherein the wavelength compensation signal is proportional to the power control signal;

wherein the temperature control circuit adjusts the temperature control signal to the thermoelectric element responsive to a difference between the temperature reference voltage input and the wavelength control signal.

23. (New) The optical transmitter of claim 22, further comprising:

an external modulator for modulating the output signal of the laser diode.

24. (New) The power control circuit of claim 22, wherein the bias current source that provides an adjustable bias current to the laser diode and having a power reference voltage input comprises:

an operational amplifier with the power reference voltage as a first input and the power adjust signal as a second input; and

a transistor, wherein an output of the operational amplifier is connected to a gate of the transistor, a reference voltage is connected to an input of the transistor and wherein the output of the transistor is connected to the laser diode and provides the adjustable bias current to the laser diode.

25. (New) An optical transmitter, comprising:

a laser diode with an output signal;

a power control circuit for controlling an adjustable bias current to the laser diode; and

a temperature control circuit that provides a temperature control signal to a thermoelectric element for controlling temperature operation and wavelength compensation of the laser diode that comprises:

a temperature reference voltage input;

a temperature monitor loop including a temperature sensor for monitoring temperature operation and providing a temperature monitor signal;  
a wavelength compensation signal added to the temperature monitor signal to provide a wavelength control signal, wherein the wavelength compensation signal is based on a wavelength of the output signal of the laser diode;  
wherein the temperature control circuit adjusts the temperature control signal to the thermoelectric element responsive to a difference between the temperature reference voltage input and the wavelength control signal.

26. (New) The optical transmitter of claim 25, wherein the wavelength compensation signal is generated by an etalon locker device that receives the output signal emitted from the laser diode.

27. (New) The optical transmitter of claim 26, wherein the etalon locker device is a Fabry-Perot etalon locker device.

28. (New) The optical transmitter of claim 25, wherein the power control circuit comprises:

a bias current source that provides an adjustable bias current to the laser diode and comprising a power reference voltage input; and  
a power monitor loop comprising a backface diode for monitoring the laser diode power output and outputting a power monitor signal.

29. (New) The optical transmitter of claim 28, wherein the bias current source that provides an adjustable bias current to the laser diode and comprising a power reference voltage input comprises:

an operational amplifier with the power reference voltage as a first input and the power monitor signal as a second input; and  
a transistor, wherein an output of the operational amplifier is connected to a gate of the transistor, a reference voltage is connected to an input of the transistor and wherein the output of the

transistor is connected to the laser diode and provides the adjustable bias current to the laser diode.